Oxidative stress and its association with cardiovascular disease in chronic renal failure patients.

ABSTRACT

Cardiovascular disease (CVD) is responsible for the majority of deaths in chronic renal failure (CRF). Oxidative stress plays a key role in pathogenesis of atherosclerosis and CVD, which is promoted by the production of reactive oxygen species (ROS) and impaired antioxidant enzymes. These ROS react with nitric oxide (NO) to produce cytotoxic reactive nitrogen species that cause oxidative injury to the endothelium. This study evaluated biomarkers of oxidative stress, NOx (total NO 2 and NO 3), and superoxide dismutase (SOD) enzyme in normal control and CRF patients as case group and correlated their association with CVD. This cross sectional study involved 173 CRF patients on different modes of treatment (hemodialysis, continuous ambulatory peritoneal dialysis (CAPD), and predialysis). Of these, 74 had CVD. The control group consisted of 33 healthy subjects who had no history of CRF and CVD. Both NOx and SOD levels were significantly lower ($P<0.05$, $P<0.001$, respectively) in the case group. Comparing between CRF patients with and without CVD, SOD level was found to be significantly lower in CRF patients with CVD ($P<0.05$). Logistic regression analysis showed significant association of CVD event with age, male gender, diabetes, SOD level, and lipid profile in CRF patients. Oxidative stress occurs in the CRF patients with or without CVD. This study found that NOx and SOD levels were reduced in all CRF patients with or without CVD. However, it was noted that the levels of these biomarkers of oxidative stress were significantly lower in CRF patients with CVD compared with CRF patients without CVD. Therefore, these oxidative stress markers maybe contributing factors in the pathogenesis of CVD in patients with CRF.

Keyword: Cardiovascular disease; Chronic renal failure; CVD; Oxidative stress.